

Application Note

— Example Applications —

Increasing Productivity by Performing Quality Inspection Immediately after Welding

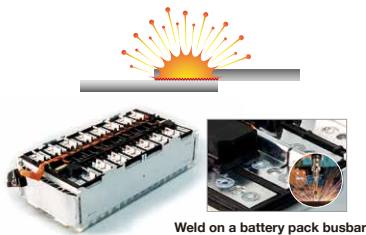
Introducing the A-OVC function for canceling out the effects of heat

Adoption of electric vehicles (EVs) is accelerating rapidly. Batteries for EVs need super-high-speed charging, and they need to be able to supply more current. Welding or connection defects in power lines carrying such large currents pose a danger of fire due to overheating. Inspection equipment used in welding processes needs to be enhanced for both battery quality and productivity.



Issue Inspections should be carried out immediately after welding, but the effects of heat make accurate measurement impossible.

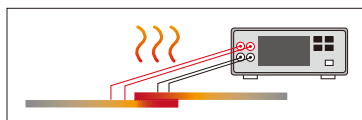
It's desirable to perform quality inspections immediately after welding in order to boost productivity!



Weld on a battery pack busbar

Immediately after welding...

The weld is still hot

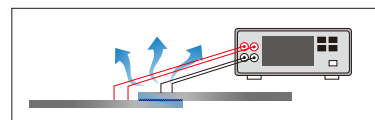


Accurate measurement is impossible due to the effects of thermal changes.

Erroneous judgment is more likely

While the weld cools...

Temperature is unstable



It's necessary to wait until the weld has cooled and stabilized.

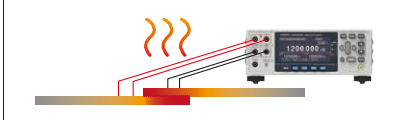
Productivity remains unchanged

To improve productivity, manufacturers wish to perform quality inspections immediately after welding work. However, the temperature of the metal is unstable immediately after welding. If resistance measurements are performed under such conditions, the effects of the heat make accurate measurement impossible. When inspecting weld resistance, it's necessary to measure very small resistance (on the order of $\mu\Omega$) to judge whether the weld is good or bad. Consequently, variations caused by the effects of heat could result in false judgments.

Solution Canceling out the effects of heat by using the RM3546's A-OVC function.

Resistance measurement by the RM3546 (A-OVC function)

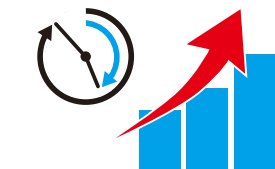
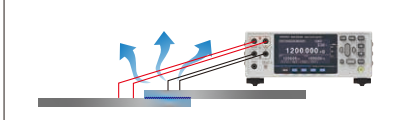
Even if the weld is hot



Measurements can be made immediately after welding, even if temperatures in the measurement area are unstable.

Inspections can be performed using with accurate measured values.

Even if temperatures are unstable



Cooling time is not needed.

Productivity increases!

The RM3546's A-OVC function can correct for the offset errors caused by thermo-electromotive force based on the amount of change in measured values. This capability makes possible stable measurement of the resistance values in batteries and motors immediately after welding, when there are substantial temperature variations.

Instrument used

WELDING RESISTANCE METER RM3546

Hioki product

HIOKI

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application_RM3546_A-OVC_E2_220222

All information correct as of Feb. 22, 2022. All specifications are subject to change without notice.